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☐	L12	L11 and l10	603
☐	L11	press$5	4622735
☐	L10	L9 and l8	904
☐	L9	resist or photoresist or (photo adj resist)	495619
☐	L8	L7 and l3	7558
☐	L7	L6 or l5	131403
☐	L6	saw	131176
☐	L5	surface adj wave adj l4	311
☐	L4	acoust$5	223757
☐	L3	piezoelect$5	175258
☐	L2	piezoelc$5	65

L9 ANSWER 5 OF 5 INSPEC (C) 2005 IEE on STN
AN 1983:2000610 INSPEC DN B83013076
TI Reverse photolithographic technique for **SAW** devices.
AU Singh, A. (Solid Sate Devices Div., CEERI, Pilani Raj, India)
SO Microelectronics and Reliability (1982) vol.22, no.5, p.949-50. 9 refs.
CODEN: MCRLAS ISSN: 0026-2714
DT Journal
TC Application; Practical
CY United Kingdom
LA English
AB Deals with the reverse photolithographic technique for the fabrication of **SAW** devices such as convolver and correlator etc. In this technique, T-shaped negative **relief mask** is first applied to the substrate and the film is deposited subsequently. As a result, the film contacts the substrate directly on in the areas left open by the **relief mask**. The **relief mask** is finally removed by a solvent which attacks only the **mask** but not the film material.
CC B2860C Acoustic wave devices
CT CORRELATORS; PHOTOLITHOGRAPHY; SURFACE **ACOUSTIC** WAVE DEVICES
ST **SAW devices**; reverse photolithographic technique; convolver; correlator; **T-shaped negative relief mask**
ET T

L10 ANSWER 1 OF 1 CA COPYRIGHT 2005 ACS on STN
AN 135:160833 CA
ED Entered STN: 30 Aug 2001
TI Development of SMD 32.768 kHz tuning fork-type crystals using photolithography and selective etching process. Part I: selective etching of an array of quartz tuning fork resonators
AU Lee, Sungkyu; Kang, Kae-Myung
CS Ceramic Team, Research and Development Center, Samsung Electro-Mechanics Co., Ltd., Suwon City, 442-743, S. Korea
SO Zeitschrift fuer Metallkunde (2001), 92(5), 501-503
CODEN: ZEMTAE; ISSN: 0044-3093
PB Carl Hanser Verlag
DT Journal
LA English
CC 76-7 (Electric Phenomena)
AB Neg. photoresist photolithog. was superior to previously used pos. photoresist photolithog. to etch an array of quartz tuning forks for use in Qualcomm mobile station modem, 3000 central processing unit, chips of code division multiple access, personal communication system and global system for mobile communication units. Optimum processing condition was devised for reproducible precision etching of Z-cut quartz wafers into an array of tuning forks. The tuning fork pattern was transferred via ordinary photolithog. chromium/quartz glass **template** using a standard single-sided aligner and subsequent neg. photoresist development. A tightly adhering and pinhole-free 600/2000 Å chromium/gold **mask** is coated over the developed photoresist pattern which was subsequently stripped in acetone. This procedure was repeated on the backside of the wafer. With protective metalization area of tuning fork geometry thus formed, etching through the quartz wafer was done at 80° in a ±1.5° controlled bath containing concentrated solution of ammonium bifluoride to remove unwanted areas of the quartz wafer. The quality of quartz wafer surface finish after quartz etching depended primarily on the surface finish of the quartz wafer prior to etching and quality of quartz crystals used. At 80°, selective etching of 100 μm quartz wafer was done within 90 min. Reproducible precision selective etching has thus been established and enables mass production of miniature tuning fork resonators with electrode patterns on them photolithog.
ST quartz tuning fork manuf etching photolithog
IT Etching
Photolithography
(photolithog. and selective etching of array of quartz tuning fork resonators)
IT Resonators
(**piezoelec.**; photolithog. and selective etching of array of quartz tuning fork resonators)
IT **Acoustic** devices
(tuning forks; photolithog. and selective etching of array of quartz tuning fork resonators)
IT 1341-49-7, Ammonium bifluoride
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in photolithog. and selective etching of array of quartz tuning fork resonators)
IT 14808-60-7, Quartz, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(photolithog. and selective etching of array of quartz tuning fork resonators)
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Danel, J; Sensors Actuators A 1990, V21-23, P971
(2) Hedlund, C; J Micromech Microeng 1993, V3, P65 CA
(3) Karasawa, S; Jpn J Appl Phys 1974, V13, P799 CA

(4) Staudte, J; Proc 27th Annual Symp on Frequency Control 1973, P50
(5) Staudte, J; Proc 35th Annual Symp on Frequency Control 1981, P583
(6) Thornell, G; IEEE Trans on Ultrasonics, Ferroelectrics, and Frequency Control 1997, V44, P829
(7) Thornell, G; IEEE Trans on Ultrasonics, Ferroelectrics, and Frequency Control 1999, V46, P981
(8) Vig, J; Proc 31st Annual Symp on Frequency Control 1977, P131 CA
(9) Yoda, H; Proc 28th Annual Symp on Frequency Control 1974, P57
(10) Yoda, H; Proc of the 26th Annual Symp on Frequency Control 1972, P140

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     (FILE 'HOME' ENTERED AT 11:02:23 ON 28 APR 2005)

     FILE 'INSPEC' ENTERED AT 11:02:44 ON 28 APR 2005
L1       144553 SAW OR ACOUSTIC
L2        48456 PIEZO##########
L3        24143 MASK
L4        34683 MOLD###### OR TEMPLATE OR TEMPLET OR RELIEF OR STAMP
L5          484 L3(P)L4
L6            0 L1 AND L2 AND L5
L7           23 L1 AND L2 AND L4
L8          484 L3 (P)L4
L9            5 L1 AND L8

     FILE 'CA' ENTERED AT 11:16:44 ON 28 APR 2005
L10           1 L1 AND L2 AND L5
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ANSWER 1 OF 6 CA COPYRIGHT 2005 ACS on STN
AN 142:124742 CA
ED Entered STN: 03 Feb 2005
TI Method for manufacturing shape structure of supersonic wave transducer array
IN Cho, Jin U.; Hong, Seong Je; Park, Jun Sik; Park, Sun Seop; Shin, Sang Mo
PA Korea Electronics Technology Institute, S. Korea
SO Repub. Korean Kongkae Taeho Kongbo, No pp. given
CODEN: KRXXA7
DT Patent
LA Korean
IC ICM H01L041-02
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 73
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	KR 2001036173	A	20010507	KR 1999-43075	19991006
PRAI	KR 1999-43075		19991006		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
KR 2001036173	ICM	H01L041-02

AB A method for manufacturing a shape structure of a supersonic wave transducer array is provided to a shape structure of a supersonic wave transducer array by using an LIGA (Lithographie; Galvanoformung, Abformung) method. A photoresist layer is formed on a conductive substrate. The photoresist layer is exposed through a **mask**. A photoresist structure is formed by developing the photoresist layer to expose an upper face of the conductive substrate. A metal **mold** is formed by performing a plating process for the photoresist structure. A supersonic wave transducer array pattern is formed on a PZT (Pb(Zr,Ti)O3) plate by pressing the metal **mold** on the PZT plate. A firing process for the PZT plate is performed.
ST shape structure supersonic wave transducer array
IT **Acoustic** transducers
Photoresists
Sound and Ultrasound
(method for manufacturing shape structure of supersonic wave transducer array)
IT 12626-81-2, Lead titanium zirconium oxide (PbTi0-1Zr0-1O3)
RL: DEV (Device component use); USES (Uses)
(method for manufacturing shape structure of supersonic wave transducer array)

L12 ANSWER 2 OF 6 CA COPYRIGHT 2005 ACS on STN
AN 136:45579 CA
ED Entered STN: 10 Jan 2002
TI Fabrication of SMD 32.768 kHz tuning fork-type crystals: photolithography and selective etching of an array of quartz tuning fork resonators
AU Lee, S.; Lee, J.-Y.; Park, T.-S.
CS Department of Molecular Science and Technology, Ajou University, Suwon, 442-749, S. Korea
SO Materials and Corrosion (2001), 52(9), 712-715
CODEN: MTCREQ; ISSN: 0947-5117
PB Wiley-VCH Verlag GmbH
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB Neg. photoresist photolithog. was used to etch array of quartz tuning forks for use in Qualcomm mobile station modem (MSM)-3000 central processing unit (CPU) chips of code division multiple access (CDMA), personal communication system (PCS), and global system for mobile

communication (GSM) units. It was found superior to pos. photoresist photolithog. Quartz tuning fork blanks with optimum shock-resistant characteristics were designed using finite element method (FEM) and processing condition was devised for reproducible precision etching of Z-cut quartz wafer into array of tuning forks. Tuning fork pattern was transferred via ordinary photolithog. chromium/quartz glass **template** using a standard single-sided aligner and subsequent neg. photoresist development. Tightly adhering and pinhole-free 600/2000 Å chromium/gold **mask** is coated over the developed photoresist pattern which was subsequently stripped in acetone. This procedure was repeated on the backside of the wafer. With protective metalization area of tuning fork geometry thus formed, etching through quartz wafer was done at 80° C in a ± 1.5° C controlled bath containing concentrated solution of ammonium bifluoride to remove unwanted area of the quartz wafer. Surface finish of quartz wafer prior to etching and the quality of quartz crystals used primarily affected the quality of quartz wafer surface finish after quartz etching. At 80° C, selective etching of 100 μm quartz wafer could be effected within 90 min. Reproducible precision selective etching method has thus been established and enables mass production of miniature tuning fork resonators photolithog.

ST neg photoresist quartz tuning fork resonator photolithog fabrication; ammonium bifluoride etching photolithog fabrication quartz tuning fork resonator

IT Negative photoresists
(photolithog. fabrication of array of quartz tuning fork resonators using neg. photoresist process)

IT Photolithography
(photolithog. fabrication of array of quartz tuning fork resonators using neg. photoresist process and selective wafer etching)

IT Communication
(telecommunication; photolithog. fabrication of array of quartz tuning fork resonators using neg. photoresist process in relation to)

IT **Acoustic** devices
(tuning forks; photolithog. fabrication of array of quartz tuning fork resonators using neg. photoresist process)

IT 1341-49-7, Ammonium bifluoride
RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); PROC (Process)
(etching; photolithog. fabrication of array of quartz tuning fork resonators using neg. photoresist process and selective wafer etching)

IT 60676-86-0, Vitreous silica
RL: DEV (Device component use); EPR (Engineering process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(photolithog. fabrication of array of quartz tuning fork resonators using neg. photoresist process)

IT 7440-47-3, Chromium, processes 7440-57-5, Gold, processes
RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); PROC (Process)
(photolithog. fabrication of array of quartz tuning fork resonators using neg. photoresist process)

IT 370569-92-9, DTFR-N250SE
RL: EPR (Engineering process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(photolithog. fabrication of array of quartz tuning fork resonators using neg. photoresist process)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE
(1) Danel, J; Sensors and Actuators 1990, VA21-A23, P971
(2) Hedlund, C; J Micromech Microeng 1993, V3, P65 CA
(3) Karasawa, S; J J Appl Phys 1974, V13, P799 CA
(4) Staudte, J; Proc 36th Annual Symp on Frequency Control 1981, P583
(5) Staudte, J; Proceedings of the 27th Annual Symposium on Frequency Control 1973, P50

(6) Thornell, G; IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control 1997, V44, P829
(7) Thornell, G; IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control 1999, V46, P981
(8) Vig, J; Proc 31st Annual Symp on Frequency Control 1977, P131 CA
(9) Yoda, H; Proceedings of the 26th Annual Symposium on Frequency Control 1972, P140
(10) Yoda, H; Proceedings of the 28th Annual Symposium on Frequency Control 1974, P57

L12 ANSWER 3 OF 6 CA COPYRIGHT 2005 ACS on STN
AN 135:336819 CA
ED Entered STN: 22 Nov 2001
TI Photolithography and selective etching of an array of quartz tuning fork resonators with improved impact resistance characteristics
AU Lee, Sungkyu
CS Department of Molecular Science and Technology, Ajou University, Suwon, 442-749, S. Korea
SO Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (2001), 40(8), 5164-5167
CODEN: JAPNDE; ISSN: 0021-4922
PB Japan Society of Applied Physics
DT Journal
LA English
CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73, 76
AB Quartz tuning fork blanks with improved impact-resistant characteristics for use in Qualcomm mobile station modem (MSM)-3000 central processing unit (CPU) chips for code division multiple access (CDMA), personal communication system (PCS), and global system for mobile communication (GSM) systems were designed using finite element method (FEM) anal. and suitable processing conditions were determined for the reproducible precision etching of a Z-cut quartz wafer into an array of tuning forks. Neg. photoresist photolithog. for the additive process was used in preference to pos. photoresist photolithog. for the subtractive process to etch the array of quartz tuning forks. The tuning fork pattern was transferred via a conventional photolithog. chromium/quartz glass **template** using a standard single-sided aligner and subsequent neg. photoresist development. A tightly adhering and pinhole-free 600/2000 Å chromium/gold **mask** was coated over the developed photoresist pattern which was subsequently stripped in acetone. This procedure was repeated on the back surface of the wafer. With the protective metalization area of the tuning fork geometry thus formed, etching through the quartz wafer was performed at 80° C in a ± 1.5° C controlled bath containing a concentrated solution of ammonium bifluoride to remove the unwanted areas of the quartz wafer. The quality of the quartz wafer surface finish after quartz etching depended primarily on the surface finish of the quartz wafer prior to etching and the quality of quartz crystals used. Selective etching of a 100 μm quartz wafer could be achieved within 90 min at 80° C. A selective etching procedure with reproducible precision has thus been established and enables the photolithog. mass production of miniature tuning fork resonators.
ST photolithog selective etching quartz tuning fork resonator fabrication
IT Simulation and Modeling, physicochemical
(finite-element; neg. photoresist photolithog. and selective etching in fabrication of array of quartz tuning fork resonators)
IT Negative photoresists
Photolithography
(neg. photoresist photolithog. and selective etching in fabrication of array of quartz tuning fork resonators)
IT **Acoustic** devices
(tuning forks; neg. photoresist photolithog. and selective etching in fabrication of array of quartz tuning fork resonators)

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L8          484 L3 (P)L4
L9            5 L1 AND L8

     FILE 'CA' ENTERED AT 11:16:44 ON 28 APR 2005
L10           1 L1 AND L2 AND L5
L11         904 L3(P)L4
L12           6 L1 AND L11

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